

WHAT IS CLAIMED IS:

1. A method of producing an electrode for a capacitor from a foil comprising:

- (a) applying a laser beam to a portion of said foil to heat said portion and create a pattern on said foil; and
- (b) etching said foil.

2. The method of claim 1, wherein said step of applying a laser beam further comprises:

heating selected portions of said foil to a temperature that causes local melting of the foil.

3. The method of claim 1, wherein said step of applying a laser beam further comprises:

heating selected portion of said foil to a temperature that causes an oxide layer to form on a surface of said foil.

4. The method of claim 1, further comprising:

applying said laser beam before said etching step.

5. The method of claim 2, further comprising:

applying said laser beam after said etching step.

6. The method of claim 1, wherein said etching step comprises:

etching said foil electrochemically.

7. The method of claim 6, wherein said etching step comprises:

(1) placing said foil in an electrochemical bath comprising an anode portion comprising an anode electrolyte and a cathode portion;

(2) connecting said foil to a charge source in the anode portion of said bath;

(3) applying a charge to said foil;

(4) monitoring the charge on said foil; and

(5) stopping said etching step when said charge reaches a predetermined level.

8. The method of claim 7, further comprising:

applying charge at a current density of about 0.10-0.25 Amp/cm².

9. The method of claim 7, wherein said stopping step comprises:

stopping said etching step when said charge reaches a predetermined level in the range of about 15 to 50 Coulombs.

10. The method of claim 7, wherein said placing step comprises:

placing said foil in an aqueous anode electrolyte comprising about 1-3% sodium chloride and about 2-5% sodium perchlorate or sodium persulfate.

11. The method of claim 10, wherein said placing step further comprises:

heating said anode electrolyte to a temperature of about 80-90°C.

12. The method of claim 1, wherein said step of applying a laser beam comprises:

applying a Nd:VO₄, Nd:YAG or a CO₂ laser to said foil.

13. The method of claim 12, wherein the step of applying a laser beam comprises:

applying a laser beam at a scan rate in the range of about 20-500 mm/sec.

14. The method of claim 13, wherein the step of applying a laser beam comprises:

applying a laser beam with spot size in the range of about 20 to about 100 microns.

15. The method of claim 1, wherein said step of applying a laser beam comprises:

applying said laser beam to create an irregular pattern on said foil.

16. The method of claim 1, wherein said step of applying a laser beam comprises:

applying said laser beam to create a ripstop, grid, crossed-grid, labyrinth, staggered hole, intersecting wave or parallel wave pattern.

17. The method claim 1, wherein said step of applying a laser beam further comprises:

applying said laser beam to both sides of said foil.

18. The method of claim 1, further comprising a step after said applying and etching steps of:

widening said foil after said step of applying laser.

19. The method of claim 1, further comprising a step of:

forming said foil.

20. The method of claim 19, wherein said forming step further comprises:

(a) forming said foil in a solution comprising citric acid;

- (b) heating said solution to a temperature in the range of about 80-100°C;
- (c) forming said foil at a current density in the range of about 10-20 mA/cm²; and
- (d) forming said foil at a voltage in the range of about 300-600 Volts.

21. An anode foil made according to the method of claim 1, suitable for use in an implantable cardioverter defibrillator.